DAIRY SCIENCE, PH.D.

Training for the Ph.D. degree prepares the candidate for a career of university teaching, research, and extension; for research in industrial or government laboratories; or for technical service in industry. The department office maintains specific information concerning career placements.

The greatest share of Ph.D. training will be achieved through selection and pursuit of a research project in a phase of dairy science in which the student has a strong interest. Students exercise individual initiative in the planning and execution of research projects. Because of the long-term nature of large-animal research, every effort is made to start students on research problems early in their graduate careers.

A Doctoral Minor in Dairy Science (http://guide.wisc.edu/graduate/dairy-science/dairy-science-doctoral-minor/) is available to doctoral students majoring in other departments. The information and required forms can be found on this website (https://andysci.wisc.edu/dairy-science-certification-forms/). Contact the department for specific requirements or questions.

The department offers one of the most comprehensive dairy science graduate programs in the country. Faculty interests and research funding in dairy science span diverse areas of focus. Fundamental training in basic science fields related to these phases of dairy science is required. Minimum admissions requirements of the Graduate School must be met. Specific degree requirements are available from the department.

There are six program areas for prospective applicants to review and choose from—see website (https://andysci.wisc.edu/students/graduate/).

Students are offered a challenging research and educational opportunity in well-equipped laboratories with modern instrumentation. Students in dairy cattle nutrition may work in collaboration with laboratories of the US Dairy Forage Research Center as well as those of the Dairy Science Department. Dairy cattle at four locations are maintained by the department for both intensive and extensive experimental work.

Research is directed toward gaining greater understanding of the biology of dairy species with emphasis on dairy cattle, and improving usefulness of these species to society by modifying milk composition, improving animal health, assessing environmental impact, and enhancing economic efficiency. Current research emphases include developing and using molecular markers and genome maps to improve accuracy of selection and speed the rate of genetic improvement; developing and applying statistical methods for estimating genetic merit of individual animals and genetic parameters of populations from performance records; studying digestive and metabolic processes in lactating ruminants to improve production efficiency and health; enhancing utilization of forage nutrients by high-producing cows through modifications of the forage plants, harvesting and storage methods, and supplemental ration ingredients; development of reproduction management programs that optimize facility and profitability of dairy farms; understanding regulation of ovarian function and the regulation of fertility in lactating dairy cows; developing and evaluating milking, feeding, record-keeping, and decision and organizational systems that contribute to profitable dairy enterprises in a changing dairy economy; management factors affecting animal health and well-being.

About one-half of the department graduate students are domestic students, with two-thirds of those students Wisconsin residents, one-third out-of-state students, and one-half of the graduate students are international students. This diversity brings a national and global perspective to research, instruction, extension, and cultural understanding.

ADMISSIONS

Please consult the table below for key information about this degree program’s admissions requirements. The program may have more detailed admissions requirements, which can be found below the table or on the program’s website. Graduate admissions is a two-step process between academic programs and the Graduate School. Applicants must meet the minimum requirements (https://grad.wisc.edu/apply/requirements/) of the Graduate School as well as the program(s).

Once you have researched the graduate program(s) you are interested in, apply online (https://grad.wisc.edu/apply/).

Requirements Detail

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Deadline</td>
<td>August 1</td>
</tr>
<tr>
<td>Spring Deadline</td>
<td>December 1</td>
</tr>
<tr>
<td>Summer Deadline</td>
<td>May 1</td>
</tr>
<tr>
<td>GRE (Graduate Record Examinations)</td>
<td>Not required but may be considered if available.</td>
</tr>
<tr>
<td>English Proficiency Test</td>
<td>Every applicant whose native language is not English or whose undergraduate instruction was not in English must provide an English proficiency test score and meet the Graduate School minimum requirements (<a href="https://grad.wisc.edu/apply/requirements/#english-proficiency">https://grad.wisc.edu/apply/requirements/#english-proficiency</a>).</td>
</tr>
<tr>
<td>Other Test(s) (e.g., GMAT, MCAT)</td>
<td>n/a</td>
</tr>
<tr>
<td>Letters of Recommendation Required</td>
<td>3</td>
</tr>
</tbody>
</table>

Master’s degrees in biology, biochemistry, or genetics, as well as dairy or animal science, provide excellent background for doctoral study in Dairy Science. Regardless of major, preparation should include biology (molecular, cellular, and population), physiology, chemistry (general and organic), mathematics (through calculus), and physics. Typically, students admitted to the doctoral program have a GPA of 3.2 or higher. Candidates without a master’s degree can be considered under special circumstances.

Documents Required By the Program:

1. Personal statement/reasons for graduate study: see website (https://grad.wisc.edu/prospective/prepare/statement/)

2. Three letters of recommendation. The process for letters of recommendation is explained on this website (https://grad.wisc.edu/admissions/faq/#rec). Letters should be from faculty who are familiar with your academic abilities and goals. Letters from supervisors that provide a character reference are also acceptable. The letters of recommendation should be submitted with the online application.

3. Official transcripts or academic records from each institution attended. These can be scanned and included with the electronic application.

1. Personal statement/reasons for graduate study: see website (https://grad.wisc.edu/prospective/prepare/statement/)

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3. Official transcripts or academic records from each institution attended. These can be scanned and included with the electronic application.
Original official transcripts will be required by the Graduate School if a department recommends applicant for admission.

The Graduate School Checklist tells you what you must include in your electronic application: see website. (https://grad.wisc.edu/admissions/process/)

International students should apply as early as possible. If you are recommended for admission and admitted, extra time will be needed to process visa documents.

Faculty Review of Completed Applications:

Most applicants have contacted program faculty directly with respect to an interest in their area of research. This means that a faculty member may be aware of an applicant’s name and background prior to reviewing a completed application for Graduate School. It is recommended that applicants contact the faculty member(s) with the area(s) of research that interests them and that they wish to pursue.

If a faculty member is interested in a completed application, the applicant will be contacted by them personally. If a faculty member is interested in accepting an applicant, a recommendation for admission will be sent to the Graduate School. The Graduate School will make the final determination for admission.

Our graduate faculty have approximately two weeks prior to the start of the semester to recommend domestic students and approximately six weeks prior to the start of the semester to recommend international students.

FUNDING

GRADUATE SCHOOL RESOURCES

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information (https://grad.wisc.edu/funding/) is available from the Graduate School. Be sure to check with your program for individual policies and restrictions related to funding.

PROGRAM RESOURCES

Research assistantships are awarded to well-qualified students on a competitive basis. Around 70 percent of M.S. and Ph.D. candidates in dairy science are supported by research assistantships. Funding does not come from the department, but from the faculty member agreeing to advise the new student. Therefore, a student joins a lab directly instead of doing rotations. Funding is awarded on a competitive basis and may be renewed annually pending satisfactory progress. Terms of these appointments are defined in the letter of offer to the student.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/#policiesandrequirementstext), in addition to the program requirements listed below.

MAJOR REQUIREMENTS

MODE OF INSTRUCTION

<table>
<thead>
<tr>
<th>Mode of Instruction Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accelerated:</strong> Accelerated programs are offered at a fast pace that condenses the time to completion. Students are able to complete a program with minimal disruptions to careers and other commitments.</td>
</tr>
<tr>
<td><strong>Evening/Weekend:</strong> Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.</td>
</tr>
<tr>
<td><strong>Face-to-Face:</strong> Courses typically meet during weekdays on the UW-Madison Campus.</td>
</tr>
<tr>
<td><strong>Hybrid:</strong> These programs combine face-to-face and online learning formats. Contact the program for more specific information.</td>
</tr>
<tr>
<td><strong>Online:</strong> These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MODE OF INSTRUCTION</th>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

CURRICULAR REQUIREMENTS

<table>
<thead>
<tr>
<th>REQUIREMENTS</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Credit Requirement</td>
<td>51 credits</td>
</tr>
<tr>
<td>Minimum Residence Credit Requirement</td>
<td>32 credits</td>
</tr>
<tr>
<td>Minimum Graduate Coursework Requirement</td>
<td>Half of degree coursework (26 credits out of 51 total credits) must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university’s Course Guide.</td>
</tr>
<tr>
<td>Overall Graduate GPA Requirement</td>
<td>3.00 GPA required.</td>
</tr>
<tr>
<td>Other Grade Requirements</td>
<td>No other specific grade requirements.</td>
</tr>
<tr>
<td>Assessments and Examinations</td>
<td>Schedule preliminary examination and file request for preliminary examination (by end of fourth semester). Complete written preliminary examination; complete oral preliminary examination (by end of fifth semester). If passed, warrant should be signed and returned to the Graduate School. Student will be a dissertator. Complete research and thesis. Regular meetings with the committee are expected. Request for final examination (includes documentation that exam requirements have been met). Final defense and examination.</td>
</tr>
<tr>
<td>Language Requirements</td>
<td>No language requirements.</td>
</tr>
<tr>
<td>Doctoral Minor/Breadth Requirements</td>
<td>All doctoral students are required to complete a minor.</td>
</tr>
</tbody>
</table>
REQUIRED COURSES

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DY SCI 900</td>
<td>Seminar (Every graduate student in the department is required to take this course every spring.)</td>
<td>1</td>
</tr>
</tbody>
</table>

Biochemistry Course (must require Organic Chemistry as a prerequisite)

Statistics Course

Dairy or Animal Science Courses

One course (at least 2 credits, grade of B or better) in each of the following:

- Animal Genetics
- Ruminant or Animal Nutrition
- Animal Physiology
- Dairy Cattle Management

Special Skills

Complete a course in two of the following three areas:

- Educational Principles (DY SCI 799 or other approved course)
- Technical Writing course or Writing Practicum
- Advanced course in Philosophy of Science, History of Science, or Ethics of Science

There are no other specific courses required. Depending on which of the six program areas of research is involved, the doctoral graduate student and their mentor committee decide on a plan of study to be completed during the research program. All selected courses must be agreed upon by the student’s graduate committee members and approved by the program certification committee. There are forms developed by the program certification committee that provide written guidelines and must be processed in a timely manner for Ph.D. students in the Dairy Science program, https://dysci.wisc.edu/dairy-science-certification-forms/. All submitted forms are reviewed by the certification committee chairperson.

POLICIES

GRADUATE SCHOOL POLICIES

The Graduate School’s Academic Policies and Procedures (https://grad.wisc.edu/acadpolicy/) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

MAJOR-SPECIFIC POLICIES

PRIOR COURSEWORK

Graduate Work from Other Institutions

The department may decide to accept coursework completed outside of the student’s graduate career at UW-Madison when those courses are rigorous and meet the expectations of a graduate work for the degree. Coursework earned five or more years prior to admission to a master’s degree or coursework earned ten or more years prior to admission to a doctoral degree is not allowed to satisfy requirements.

UW-Madison Undergraduate

For well-prepared advanced students, the department may decide to accept up to 7 credits, numbered 300 or above, completed at UW-Madison toward fulfillment of minimum degree credit requirements. These credits would not be allowed to count toward the 50% graduate coursework minimum unless taken at the 700 level or above.

UW-Madison University Special

Courses taken post-B.S. as a University Special student do not automatically count toward a graduate degree. A maximum of 15 credits may be allowed for courses numbered 300 or above as fulfillment of the minimum graduate residence credits. UW-Madison coursework taken as a University Special Student would not be allowed to count toward the 50% graduate coursework minimum unless taken at the 700 level or above.

If Special student credits are applied toward a UW-Madison graduate degree, it will be required to pay the difference between the cost of the Special student credits and graduate credits.

PROBATION

In compliance with Graduate School policy, listed below, and at discretion of Ph.D. committee.

If students were admitted on probation and they satisfy the conditions outlined at the time of admission, probationary status will be removed automatically. Once their studies have begun, students are expected to make satisfactory progress toward their degree.

Students must be in good academic standing with the Graduate School, their program, and their advisor. The Graduate School regularly reviews the record of any student who received grades of BC, C, D, F, or I in graduate-level courses (300 or above), or grades of U in research and thesis. This review could result in academic probation with a hold on future enrollment, and the student may be suspended from graduate studies.

The Graduate School may also put students on probation for incompletes not cleared within one term. All incomplete grades must be resolved before a degree is granted.

ADVISOR / COMMITTEE

To complete the Ph.D. degree in Dairy Science, successful completion of the following items is required. These must be completed in a timely fashion or the student will not be allowed to continue registration. Please note that minimum requirements are provided, however successful completion of the Ph.D. requires achievement of the standing of demonstrated scientist, through your Ph.D. program and by making a significant research contribution to the scientific literature.

- Form a Ph.D. mentor and examination committee (by end of first semester).
- Meet with the Ph.D. committee. Develop and approve a plan of coursework consistent with approved research plans (by end of second semester).

CREDITS PER TERM ALLOWED

15 credits

TIME CONSTRAINTS

Form a Ph.D. mentor and examination committee by end of first semester.

Meet with the Ph.D. committee. Approve coursework and immediate research plans by end of second semester.
Schedule preliminary examination and file request for preliminary examination by end of fourth semester.

Complete written preliminary examination; complete oral preliminary examination by end of fifth semester.

A candidate for a doctoral degree who fails to take the final oral examination and deposit the dissertation within five years after passing the preliminary examination may be required to take another preliminary examination and to be admitted to candidacy a second time.

Doctoral degree students who have been absent for ten or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

GRIEVANCES AND APPEALS

These resources may be helpful in addressing your concerns:

- Bias or Hate Reporting (https://doso.students.wisc.edu/bias-or-hate-reporting/)
- Graduate Assistantship Policies and Procedures (https://hr.wisc.edu/policies/gapp/#grievance-procedure)
- Hostile and Intimidating Behavior Policies and Procedures (https://hr.wisc.edu/hib/)
  - Office of the Provost for Faculty and Staff Affairs (https://facstaff.provost.wisc.edu/)
- Dean of Students Office (https://doso.students.wisc.edu/) (for all students to seek grievance assistance and support)
- Employee Assistance (http://www.eao.wisc.edu/) (for personal counseling and workplace consultation around communication and conflict involving graduate assistants and other employees, post-doctoral students, faculty and staff)
- Employee Disability Resource Office (https://employee.disabilities.wisc.edu/) (for qualified employees or applicants with disabilities to have equal employment opportunities)
- Graduate School (https://grad.wisc.edu/) (for informal advice at any level of review and for official appeals of program/departmental or school/college grievance decisions)
- Office of Compliance (https://compliance.wisc.edu/) (for class harassment and discrimination, including sexual harassment and sexual violence)
- Office of Student Conduct and Community Standards (https://conduct.students.wisc.edu/) (for conflicts involving students)
- Ombuds Office for Faculty and Staff (http://www.ombuds.wisc.edu/) (for employed graduate students and post-docs, as well as faculty and staff)
- Title IX (https://compliance.wisc.edu/titleix/) (for concerns about discrimination)

College of Agricultural and Life Sciences: Grievance Policy

In the College of Agricultural and Life Sciences (CALS), any student who feels unfairly treated by a member of the CALS faculty or staff has the right to complain about the treatment and to receive a prompt hearing. Some complaints may arise from misunderstandings or communication breakdowns and be easily resolved; others may require formal action. Complaints may concern any matter of perceived unfairness.

To ensure a prompt and fair hearing of any complaint, and to protect the rights of both the person complaining and the person at whom the complaint is directed, the following procedures are used in the College of Agricultural and Life Sciences. Any student, undergraduate or graduate, may use these procedures, except employees whose complaints are covered under other campus policies.

1. The student should first talk with the person at whom the complaint is directed. Most issues can be settled at this level. Others may be resolved by established departmental procedures.

2. If the student is unsatisfied, and the complaint involves any unit outside CALS, the student should seek the advice of the dean or director of that unit to determine how to proceed.
   a. If the complaint involves an academic department in CALS the student should proceed in accordance with item 3 below.
   b. If the grievance involves a unit in CALS that is not an academic department, the student should proceed in accordance with item 4 below.

3. The student should contact the department’s grievance advisor within 120 calendar days of the alleged unfair treatment. The department administrator can provide this person’s name. The grievance advisor will attempt to resolve the problem informally within 10 working days of receiving the complaint, in discussions with the student and the person at whom the complaint is directed.
   a. If informal mediation fails, the student can submit the grievance in writing to the grievance advisor within 10 working days of the date the student is informed of the failure of the mediation attempt by the grievance advisor. The grievance advisor will provide a copy to the person at whom the grievance is directed.
   b. The grievance advisor will refer the complaint to a department committee that will obtain a written response from the person at whom the complaint is directed, providing a copy to the student. Either party may request a hearing before the committee. The grievance advisor will provide both parties a written decision within 20 working days from the date of receipt of the written complaint.
   c. If the grievance involves the department chairperson, the grievance advisor or a member of the grievance committee, these persons may not participate in the review.
   d. If not satisfied with departmental action, either party has 10 working days from the date of notification of the departmental committee action to file a written appeal to the CALS Equity and Diversity Committee. A subcommittee of this committee will make a preliminary judgement as to whether the case merits further investigation and review. If the subcommittee unanimously determines that the case does not merit further investigation and review, its decision is final. If one or more members of the subcommittee determine that the case does merit further investigation and review, the subcommittee will investigate and seek to resolve the dispute through mediation. If this mediation attempt fails, the subcommittee will bring the case to the full committee. The committee may seek additional information from the parties or hold a hearing. The committee will present a written recommendation to the dean who will provide a final decision within 20 working days of receipt of the committee recommendation.

4. If the alleged unfair treatment occurs in a CALS unit that is not an academic department, the student should, within 120 calendar days of the alleged incident, take his/her grievance directly to the Associate Dean of Academic Affairs. The dean will attempt to resolve the problem informally within 10 working days of receiving the
complaint. If this mediation attempt does not succeed the student may file a written complaint with the dean who will refer it to the CALS Equity and Diversity Committee. The committee will seek a written response from the person at whom the complaint is directed, subsequently following other steps delineated in item 3d above.

OTHER
The Dairy Science program has a rolling admission policy. Campus visits are recommended along with direct program faculty contacts. Funding may be available for a research assistant position from a faculty member if an applicant meets their research requirements. No applicant can be seriously considered until they have submitted an application to the UW-Madison Graduate School with the supporting documentation.

PROFESSIONAL DEVELOPMENT

GRADUATE SCHOOL RESOURCES
Take advantage of the Graduate School’s professional development resources (https://grad.wisc.edu/pd/) to build skills, thrive academically, and launch your career.

LEARNING OUTCOMES
1. Understand and summarize ideas and concepts, into a coherent biological model, research problem(s), and research project that will go beyond the current boundaries of knowledge within Dairy Science.
2. Create research and scholarship that makes a substantive contribution to the field of Dairy Science.
3. Orally communicate complex ideas in a clear and understandable manner in a scientific, classroom, and/or industry setting.
4. Statistically analyze data, summarize the results in tables and/or graphs, and provide valid interpretation of the results.
5. Communicate in accurate written English and in the format of a scientific journal, complex ideas and research results.
6. Foster ethical and professional conduct and have knowledge in a broad range of areas that are important for their professional development.

PEOPLE

ANIMAL AND DAIRY SCIENCES DEPARTMENT
Professors
Weigel (Chair), Khatib (Associate Chair), Cabrera, Claus, Crenshaw, Fricke, Kirkpatrick, Parrish, Reed, Richards, Ricke, Rosa, Sindelar, Wattiaux, Wiltbank

Associate Professors
Hernandez, White

Assistant Professors
Adcock, Arriola Apelo, Dorea, Ferraretto, Guo, Laporta, Leone, Peñagaricano, Shanmuganayagam, Van Os

Instructors/Lecturers
Halbach, Kean, O’Rourke, Ronk, Williams

Student Services Coordinator
Liv Sandberg

Graduate Coordinator
Megan Sippel